of hull, from the flatness of bottom and fullness of ends; (2) weakness of action of rudder, from its position in the dead-water; (3) an active turning force, consisting in a one-sided pressure on the stern arising out of a one-sided system of flow in the water closing in behind the full run. It was principally to the last-mentioned cause that Mr. Froude, when called upon to investigate the case of the *Ajax*, was inclined to attribute the behaviour of the ship, such a phenomenon having been some years since incidentally observed in the course of experiments made in the experiment tank at Torquay on the resistance of a model having a full run. In this case a lateral force was found to be developed upon the stern of the model, accompanied by a trailing away of the wake to one side, and a transverse flow of the water across behind the stern, in the opposite direction to that in which the lateral force was developed. This one-sidedness of flow, and consequent force (like the helm tendency of the *Ajax*), was sometimes in one direction, and sometimes in the other, and occasionally reversed its direction during any experiment; but was generally more or less persistent in direction when initiated, although the direction in which it was initiated was apparently a matter of accident. It was Mr. Froude's belief, founded on these and many other experiments of various kinds, that this species of, so to speak, spasmodic one-sidedness of flow, and consequent one-sided force, attends the motion of all, even perfectly symmetrical, bodies through water, whenever their leaving lines are blunt enough to cause a large eddy behind them.

By way of a method of experiment suitable to test the effect of remedies designed to mitigate or remove either of the three presumable causes of the behaviour of the ship, which have been enumerated above, Mr. Froude towed a model of the *Ajax* in the experiment tank at Torquay, the model being attached to the towing carriage in such a way that, while the model was free to sheer out of the straight course, any such attempted sheering motion actuated a working rudder fitted to the model, in the proper direction for frustrating the attempt. By this contrivance the model was made to steer quite straight, and the criterion of the badness of the steering qualities of the model in the several conditions of trial subjected to experiment, was the amount and the degree of unsteadiness of the helm angle administered, this helm angle being continuously recorded throughout each experiment by an automatic apparatus. Thus tested, the model was found to exhibit conspicuously what has been referred to as the predominant characteristic of the behaviour of the ship, viz. the large helm angle, sometimes persistently on one side, sometimes on the other, and occasionally changing from one side to the other.

The principal remedies tentatively applied to the model with a view to identifying the main source of the evil, and indicating the direction in which improvement was to be sought, were these: (1) a deep keel, to supply "the directive character" in which the hull itself was presumably lacking; (2) placing the rudder altogether below the keel, so as to be quite clear of the dead-water; (3) an extensive dead-wood (or fixed rudder) behind the stern-post, (the working rudder being still below the keel), to frustrate the one-sided flow behind the stern, and do away with the consequent turning force. Of these three kinds of remedy the last-named proved much the most effective, proved indeed an almost perfect cure, thereby confirming the surmise that the one-sided flow at the stern was the chief source of the evil. A minor modification of this dead-wood, with the rudder in its proper place, such as could be practically applied in the ship, likewise proved very tolerably effective, the average helm angle required being reduced to one-third of its amount.

On the strength of the results of these experiments, the Admiralty added a structure of this kind to the stern of the ship, with a result which, while it was a remarkable corroboration of the model experiments, was also on the whole a decided success from a practical point of view, the reduction effected in angle of helm being quite sufficient to qualify the ship to steam at full speed in a squadron and keep station satisfactorily.

EDWARD T. HARDMAN.

By the unexpected death of this geologist, on the 30th ult., Irish Science has been deprived of one of her most promising followers. Mr. Hardman was born in Drogheda in 1845, and distinguished himself by the position he took at the Grammar School there, gaining a Government Exhibition and an entrance to the Royal College of Science in Dublin. He soon displayed his strong natural bent towards scientific pursuits, and when he quitted the College he had gained its diploma of Associate and taken a prominent place among its foremost students, more particularly in the departments of chemistry and geology. In 1870 he was appointed to the Geological Survey, and threw himself with characteristic ardour into the prosecution of field-work, while his knowledge of chemistry and mineralogy led to his being employed in special services where this knowledge was made available in the work of the Survey. His reports on the Tyrone and Kilkenny coal-fields are good examples of the extent of his knowledge and of his powers of literary expression. He also made his mark by the publication of papers outside the limits of official work. His interesting and suggestive memoir on the origin of Lough Neagh and his papers on anthracite and chert are well known.

In 1883 the Government of Western Australia applied to the Colonial Office for the services of a trained geologist to examine and report on the mineral resources and geological structure of the colony. Mr. Hardman was selected for the post, and obtained leave of absence from the Home Government to enable him to undertake the duties. He was absent upwards of two years, during which time he effected a preliminary survey of a wide tract of unexplored country, and made known its geological structure. In particular, he indicated the presence of gold, and pointed out the areas where gold-fields might be looked for. After enduring great hardships in the bush, he returned to this country, and resumed his duties in the Geological Survey. But the exposure in the Australian climate seems to have told upon his health. He had not been quite well during the spring, and at last he rapidly fell a victim to an attack of typhoid fever. We understand that arrangements had been nearly completed for recalling him permanently to take charge of the mineral surveys of Western Australia, when his sudden death occurred. He has left a widow and two children with no adequate provision, and his friends have already begun to take steps for collecting subscriptions for their behoof. Prof. V. Ball, of the Science and Art Museum, Dublin, and Dr. Henry Woodward, of the Natural History Department of the British Museum, Cromwell Road, S.W., have kindly undertaken to receive subscriptions.

NOTES.

The Natural History branch of the British Museum in Cromwell Road has just received a most important donation from Lord Walsingham, consisting of a collection of Lepidoptera with their larvæ, mainly British butterflies (*Rhopalocera*) and certain families of moths (*Heterocera*), including *Sphingidæ*, *Bombyces*, *Pseudobombyces*, *Noctuæ*, *Geometridæ*, and *Pyralidæ*. There is also a fine series of Indian species, collected and preserved at Dharmsala, in the Punjab, by the Rev. John H. Hocking, and specimens of exotic silk-producing Bombyces in various stages of their development, obtained mostly from M. Wailly. With very few exceptions, the British larvæ, which retain a most life-like appearance, and are placed upon models of the plants upon which they feed, have been prepared and mounted by Lord Walsingham himself; the process adopted having been inflation of the empty skin of the caterpillar by means of a glass tube and india-rubber spray-blower over a spirit-lamp guarded by wire gauze. This has been found a simpler and quicker process, and one admitting of more satisfactory manipulation, than the alternative system of baking by means of heated metal plates or ovens. The specimens have mostly retained their natural colour, but in the case of the bright green species it has been found necessary to introduce a little artificial dry pigment. The whole collection consists of 2540 specimens of larvæ, belonging to 776 species, together with a series of the perfect insects of each species. As continued exposure to light is, unfortunately, most detrimental to the colours of insects, this collection cannot be exhibited permanently, but for the advantage of those who would like to see it without any restriction, it will be placed in the entrance hall of the Museum for a period of six weeks, including the Whitsuntide holidays and the Jubilee week in June.

THE Ladies' *Soirée* at the Royal Society will be held on June 8.

THE following men of science have been elected Foreign Members of the Linnean Society:—(Botanists) Dr. George A. Schweinfurth, Professor of Botany, Cairo, Egypt, whose travels and botanical researches in Central Africa are widely known; Count H. Solms-Laubach, Professor of Botany, University of Göttingen, whose observations on the Corallines, Gulf of Naples, and investigations in plant anatomy, especially that of flowering parasites, &c., are acknowledged biological contributions of merit; M. le Dr. Melchior Treub, Director of the Jardin Botanique, Buitenzorg, Java, whose studies among the Lycopods, Cycads, Lichens, &c., and whose labour in editing the "Annales du Jardin de Buitenzorg" are highly appreciated: (Zoologists) Dr. Franz Steindachner, Conservator of Herpetology and Ichthyology, Royal Museum, Vienna, distinguished for his very numerous and important memoirs on fish and reptiles generally; and Dr. August Weismann, Professor of Zoology, University of Freiburg, Baden, noted for his studies on the theory of descent, and embryological researches on insects and hydroids. Mr. William H. Beeby and Mr. Adolphus H. Kent, of London, and Mr. J. Medley Wood, of Durham, Natal, all three worthy workers in various departments of botany, have been elected Associates of the Society.

A LINNEAN herbarium has just been presented to the Upsala University by Prof. H. Sötherstrand, by whom it was inherited. It has been found by comparison of names to be a duplicate of that possessed by the Linnean Society of London.

THE Russian traveller, General Prjevalsky, is shortly to be presented with a gold medal by the Imperial Scientific Society of St. Petersburg, which has been specially struck, by order of the Emperor, in his honour. The medal bears on the obverse the initials of the recipient, and on the reverse the inscription "To the first student of the Natural History of Central Asia."

THE Paris Society of Civil Engineers offers a prize of 3000 francs for the best *éloge* of Henry Giffard, the well-known aëronaut and inventor of the injector. This competition is open to foreigners, but the papers must be written in French.

ON Monday evening the session of the Institution of Mechanical Engineers was opened at the Institution of Civil Engineers, Great George Street, Westminster. The President, Mr. E. H. Carbutt, delivered the inaugural address, taking as his subject, "Fifty Years' Progress in Gun-making."

THE sixtieth meeting of the German Association of Naturalists will be held at Wiesbaden on September 18–24 next. A number of new scientific instruments and preparations will be shown. All inquiries are to be directed to Herr Dreyfus, 44 Frankfurterstrasse, Wiesbaden.

THE County of Middlesex Natural History and Science Society will hold their first annual *soirée* on Monday, the 23rd inst., at 11 Chandos Street, Cavendish Square. The chair will be taken at 8 p.m. by Lord Strafford, Lord-Lieutenant of Middlesex, and President of the Society. Objects of scientific interest will be exhibited.

THE total value of the fish landed upon the coasts of Scotland during the four months ended April 1887 was £343,337, being a decrease of £10,591 upon the corresponding period last year.

A COLLECTION of Indian cocoons is about to be sent by the Indian Government to Manchester, where it will be open for inspection. Infected cocoons are to be despatched to France for examination by M. Pasteur's pupils, who, it is hoped, will be able to suggest means for checking the disease which has nearly ruined the silk industry of India.

THE largest piece of amber ever discovered was recently dug up near the Nobis Gate, at Altona. It weighed 850 grammes.

THE ravages of the May-bug in Denmark have become so serious that a Bill is now under the consideration of the Danish Parliament proposing that the cost of the destruction of these insects shall be borne half by the State and half by local authorities.

THE Dutch Government intends to construct a railway in Sumatra, the cost of which will be nearly £1,400,000 (16,000,000 florins). The object is to facilitate the working of the coal-fields near the River Umbili. The coal deposit in these fields is reckoned to consist of about two hundred millions of tons.

AN interesting paper on "An Ideal Natural History Museum," read lately by Prof. W. A. Herdman before the Literary and Philosophical Society of Liverpool, has been issued as a pamphlet. Prof. Herdman calls attention to the strange fact that the Darwinian theory of evolution has had, as yet, little or no effect upon the structure and arrangement of museums of natural history. He urges that a phylogenetic arrangement would have the following advantages over the linear arrangement now employed in our museums:—(1) A phylogenetic arrangement would give a much more accurate representation of Nature. (2) While being more intelligible and instructive to the general public, it would be more in accord with the present state of biological knowledge, and could very readily be slightly altered from time to time so as to keep abreast with the progress of science. (3) It would be a perpetual illustrated lecture, of the best kind, demonstrating to everyone with ordinary intelligence the great doctrine of organic evolution.

ON April 14 about 9.15 p.m. a large meteor was observed at Throndhjem, in Northern Norway. It went in a direction from north to north-east, and during its passage the light was so brilliant that the smallest objects in the snow were visible. It burst, as it seemed, into thousands of fragments, but there was no sound or report. Before bursting, the meteor was green, but during that process it displayed colours of red, yellow, and green, chiefly the latter.

M. E. FERRIERE has published a book called "La Matière et l'Energie," summarising the latest results of physical investigation concerning matter and force.

THE second number of the "Jahrbuch der Naturwissenschaften" (a volume of nearly 600 pages) has just been issued. This useful periodical is edited by Dr. Max Wildermann, and published by Herr B. Herder, of Freiburg-im-Breisgau. The present volume contains a clear and popular account of the work done in each of the sciences in the year 1886.

WE understand that the second part of the "Manual of Practical Botany," by Prof. Bower and Dr. Sydney Vines, will be published by Messrs. Macmillan and Co. in the course of a few weeks. It will include the Bryophyta and the Thallophyta; among the chief types used being *Polytrichum commune, Marchantia polymorpha, Polysiphonia fastigiata, Fucus serratus, Coleochæte scutata, Volvox globator, Agaricus campestris, Claviceps purpurea, Eurotium Aspergillus, Pythium de Baryanum,* and *Mucor mucedo.* Besides these a good many subsidiary types are used to illustrate special points.

"A CLASSIFICATION OF ANIMALS," drawn up by Mr. E. T. Newton for Mr. H. B. Woodward's "Geology of England and Wales," has now been issued separately. It is founded on the classifications proposed by Prof. Huxley, with such modifications as are, in the author's opinion, rendered necessary by recent discoveries.

THE Annual Report of the Royal Alfred Observatory, Mauritius, for the year 1885, has been issued. The mean temperature for the year at the Observatory was 73°·6. The highest reading was 86°·7 in February, and the lowest 57°·4 in July. Rain fell on 200 days, and amounted to 44·61 inches; the fall was below the average in the usually wet months of January to April, but above the average in the usually dry months of May to October. The island has not been visited by a hurricane since March 1879, although several cyclones have passed not far from it. The Report contains observations made at various stations in the island and at the Seychelles, and notices of storms in the Indian Ocean, collected from ships' logs. Photographs of the sun were also taken daily, when the weather permitted. There were 354 days on which it is certain that spots were on the sun's disk, and eight days on which it is certain that there were none. The number of spots in May was unusually great.

IN a recent book, "L'Enseignement actuel de l'Hygiène dans les Facultés de Médecine en Europe," Prof. Lœwenthal, of Lausanne, shows that the time allowed per year for the teaching of hygiene varies from 20 minutes per week in England to 9 hours per week in Spain. The other countries range between these two extremes. The average is from 2½ to 3 hours per week for the whole year.

IN the May number of the *American Journal of Science* will be found a paper by Mr. Carey Lee, of Philadelphia, in which are described a remarkable series of salts of silver, which the author is attempting to make use of in obtaining photographs of objects in their natural colours. It is first shown, by an exhaustive series of experiments, that when light acts upon ordinary silver chloride, $AgCl$, in presence of hydrochloric acid, the darkening is due to the formation of a small quantity of subchloride, Ag_2Cl, which enters into combination with the unaltered silver chloride to form a reddish compound of a nature similar to that of a "lake." This red chloride of silver is termed protochloride, and is found to be, unlike subchloride, unattacked by cold strong nitric acid. After a certain amount of this substance is formed, the action of light appears to cease—a phenomenon which has been frequently noted by other observers. Successful efforts were then made to prepare protochlorides, bromides, and iodides of this nature, and a full description of the very numerous methods and analyses is given in the memoir. The startling fact was discovered that all varieties of tints from one end of the spectrum to the other could be obtained under suitable conditions. Normally, the protochloride of silver is red, even one-half per cent. giving to ordinary silver chloride a strong coloration; but on exposure to diffused sunlight it quickly changes to purple. On addition of mercuric chloride it becomes gray, potassium bromide changes it to a permanent lilac, potassium iodide to a bluish tint, while a mixture of potassium chlorate and hydrochloric acid causes it to pass through pink and flesh-colour to pure white. Heat, on the contrary, causes it to retake its red coloration, and on exposure to various parts of the spectrum it affects lovely shades of the most varied hues. The important observation was made that, in presence of small quantities of lead or zinc chloride, white light (which darkens the pure protochloride) bleaches it, thus producing white in those portions of the image which ought to be white; and it was also found that the addition of a little sodium salicylate enhances the sensitiveness threefold. The experiments are being continued, and appear likely to lead to important results in chromo-photography.

THE current number of the *Auk* (vol. iv. Part 2) contains some interesting papers, but none of great importance. The want of finality in the system of nomenclature now practised by the American ornithologists is as marked as ever. Thus, Dr. Stejneger, having previously settled the synonymy of the redpolls, by the confounding of all received nomenclature, and the introduction of nine new synonyms into the already over-burdened literature of six species, here furnishes a tenth hitherto unrecorded title for our British redpoll; and Mr. Brewster follows suit by adding another synonym to one of the American species of the same group. It might be well for ornithologists to consider whether the best plan would not be, as Mr. Seebohm advises, to simplify matters by accepting in every case the name that happens to have been for a long time most in vogue.

IN an interesting paper on the Ailsa Craig Lighthouse, read lately before the Scottish Institution of Engineers and Shipbuilders, Mr. G. M. Hunter drew attention to the admirable system of illumination and signalling in the Firth of Clyde. There are Corsewall Point light, alternating white and red, at the entrance to Loch Ryan, distant from the Craig 17 miles; Sanda Isle light, off the Mull of Kintyre, distant 18 miles; Turnberry light, off the Ayrshire coast, distant 12 miles; Pladda light and fog-signals, off the southern end of Arran, distant 12 miles; and Holy Isle green and red light, distant 18 miles—all of which are revolving lights, with the exception of the fixed lights at Pladda and Holy Isle. These lights are all under ordinary circumstances visible from Ailsa Craig.

IN the *Izvestia* of the Russian Geographical Society there are some interesting remarks, by A. N. Krasnoff, on the history of the valley of the Ili River in Russian Turkestan. The Russian traveller considers that during the post-Pliocene age the valley of the Ili was nearly all occupied by water, and that the vegetation on the shores of this basin was quite different from that which exists now. It resembled, he thinks, the present vegetation of Middle Russia. There were forests of deciduous trees, among which maples, elm-trees, and apple-trees prevailed, and black-earth steppes occupied wide areas. Relics of this vegetation survive only at the foot of the snow-clad mountains, where they find the necessary moisture. Several of the species have there undergone remarkable adaptations, which permit them to support the rigorous continental climate. Deprived of the moisture of the snow-clad peaks, the vegetation of the lower ridges has completely changed since the recent desiccation of those parts of Asia. These ridges are covered now with a purely Central-Asiatic flora. As to the shores of Lake Balkhash and Ala-kul, they are either stony deserts with small grassy plants, or shifting sands covered with the characteristic Aral-Caspian bushes nearly destitute of leaves. The Balkhash was formerly a much greater lake than it is now, and it is rapidly becoming smaller. The depth of the Ala-kul Gulf has so far diminished that the Kirghizes already ford the strait which connects it with the lake. None of the rivers given on our maps as flowing into the Ala-kul Gulf and Lake Balkhash from the south-west were found by M. Krasnoff. They have all dried up.

THE additions to the Zoological Society's Gardens during the past week include an Alexandrine Parrakeet (*Palæornis alexandri*) from India, presented by Miss Ada Marshall; two Chinese Geese (*Anser cygnoides*) from China, presented by Miss Hoare; four Midwife Toads (*Alytes obstetricans*), South European, purchased; a Blue-cheeked Parrakeet (*Platycercus cyanogenys*) from North Australia; a Pied Crow Shrike (*Strepera graculina*) from Australia; a Sun Bittern (*Eurypyga helias*) from South America, received in exchange; a Blood-breasted Pigeon (*Phlogœnas cruentata*); two Dwarf Chameleons (*Chamæleon pumilus*) bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

MICROMETRIC MEASURES OF JUPITER AND SATURN.—In the recently-published "Observations," made at the Hong Kong Observatory during 1886, Dr. Doberck gives some measures of Jupiter and Saturn made with the 6-inch Lee equatorial now at Hong Kong. The measures of Jupiter, extending from August 29, 1879, to April 7, 1886, include the position-angle of the polar axis, the apparent equatorial and polar diameters, the breadth of the equatorial belts and of the red spot, and the length of the latter when on the central meridian. Dr. Doberck concludes that the equatorial and polar diameters at the mean distance of Jupiter are 38″·207 and 35″·942 respectively, and that the equatorial semi-diameter at the mean distance of the earth from the sun is 99″·39. The measures of Saturn extend from January 3, 1879, to April 5, 1886, and include the position-angle of the polar axis, the external diameter of the ring, the diameter of Cassini's division, the internal diameter of the ring, and the equatorial and polar diameters of the planet. The deduced dimensions at the mean distance of Saturn are:—External diameter of ring 40″·28, diameter of Cassini's division 34″·42, internal diameter 26″·82, equatorial diameter of Saturn 17″·22, and polar diameter 16″·53. The equatorial semi-diameter at the mean distance of the earth from the sun is 82″·11.

PRESENT APPEARANCE OF SATURN'S RING.—M. Stuyvaert, Assistant-Astronomer at the Royal Observatory, Brussels, has recently presented a couple of drawings of Saturn to the Royal Belgian Academy. These were made on February 8 and 15 in the present year, and show the Cassinian division as encroaching on the outer ring, A, in a remarkable series of shaded indentations. Ring B is nearly broken up into a series of bright white spots by a number of dusky indentations on its inner border of a similar shape, and the dusky ring, C, likewise shows two dark notches on the inner side of the following ansa. Struve's division between B and C was also seen, and appeared on February 8 to be formed by a succession of dark gray spots. These observations are largely supported by those of Dr. Terby and Mr. Elger, published in the *Observatory* for March and April. Mr. Elger observed three or four "large re-entering angles like the teeth of a saw" on the inner margin of the dusky ring. This was on the preceding ansa, and not the following, as in M. Stuyvaert's observations, but the rotation of the ring would account for the change. Mr. Elger also noticed on February 25 that the preceding ansa of the dusky ring was unequally black, certain parts of its surface appearing quite black. These black spots were also noticed and drawn by Dr. Terby, who likewise remarked the unusual distinctness and breadth of Struve's division. It would appear, therefore, from these and other recent observations that the matter composing the ring system is at present much less symmetrically and evenly distributed than usual. Irregularities in the inner borders of the various rings, such as the above observers describe, have indeed been observed before, Trouvelot, for example, having remarked notches in Ring A, and Jacob similar indentations in the dusky ring, but they are not ordinarily seen.

THE RED SPOT UPON JUPITER.—From some recent observations of this object published by Mr. Stanley Williams in the May number of the *Observatory*, it appears that the ephemeris given by Mr. Marth in the *Monthly Notices* for November 1886, is about a quarter of an hour too late. The red spot may therefore be expected to be on the central meridian at about the following times:—

	h.	m.		h.	m.		h.	m.
May 24...	21	33	June 7...	23	6	June 19...	23	0
,, 26...	23	11	,, 10...	20	35	,, 22...	20	30
,, 29...	0	49	,, 12...	22	14	,, 24...	22	8
,, 31...	22	19	,, 14...	23	53	,, 26...	23	46
June 2...	23	57	,, 15...	19	43	,, 27...	19	38
,, 5...	21	27	,, 17...	21	22	,, 29...	21	16

The above times are expressed in Greenwich civil time, and are reckoned from midnight to midnight.

DISCOVERY OF A NEW COMET.—A new comet was discovered on May 12, by Mr. E. E. Barnard, Nashville, Tennessee, U.S.A. Place, May 12, 16h. 57m., R.A. 15h. 10m. 58s., Decl. 31° 25′ S. The comet was only faint.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 *MAY* 22-28.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 22.

Sun rises, 4h. 1m.; souths, 11h. 56m. 24·6s.; sets, 19h. 52m.; decl. on meridian, 20° 23′ N.: Sidereal Time at Sunset, 11h. 52m.

Moon (New on May 22) rises, 4h. 18m.; souths, 11h. 38m.; sets, 19h. 9m.; decl. on meridian, 14° 17′ N.

Planet.	Rises. h. m.		Souths. h. m.		Sets. h. m.		Decl. on meridian. ° ′
Mercury ...	3 47	...	11 31	...	19 15	...	18 38 N.
Venus ...	6 17	...	14 47	...	23 17	...	25 14 N.
Mars ...	3 43	...	11 29	...	19 15	...	18 56 N.
Jupiter...	16 26	...	21 43	...	3 0*	...	9 14 S.
Saturn...	7 16	...	15 23	...	23 30	...	22 8 N.

* Indicates that the setting is that of the following morning.

May		h.		
26	...	8	...	Venus in conjunction with and 5° 18′ north of the Moon.
26	...	17	...	Saturn in conjunction with and 2° 45′ north of the Moon.
27	...	14	...	Mercury in superior conjunction with the Sun.

Variable Stars.

Star.	R.A. h. m.		Decl. ° ′			h. m.	
U Cephei	0 52·3	...	81 16 N.	...	May 24,	2 18	*m*
U Canis Minoris...	7 35·2	...	8 39 N.	...	,, 22,		*m*
δ Libræ	14 54·9	...	8 4 S.	...	,, 28,	2 44	*m*
U Ophiuchi... ...	17 10·8	...	1 20 N.	...	,, 25,	1 48	*m*
					and at intervals of	20 8	
W Sagittarii ...	17 57·8	...	29 35 S.	...	May 28,	21 0	*M*
η Aquilæ	19 46·7	...	0 43 N.	...	,, 27,	3 0	*m*
R Sagittæ	20 8·9	...	16 23 N.	...	,, 28,		*m*
R Vulpeculæ ...	20 59·4	...	23 22 N.	...	,, 22,		*m*
δ Cephei	22 25·0	...	57 50 N.	...	,, 26,	3 0	*m*

M signifies maximum; *m* minimum.

Meteor-Showers.

	R.A.		Decl.
Near *o* Draconis	280°	... ...	54° N.
γ Cygni	301	... ...	37 N.
From Lacerta	329	... ...	48 N.

GEOGRAPHICAL NOTES.

THE new Ergänzungsheft (No. 86) of *Petermann's Mitteilungen* contains a monograph of great importance in scientific geography by Dr. Rudolf Credner, Professor of Geography at Greifswald, on "Die Reliktenseen," which he defines broadly so as to include all lakes of marine origin, whether they do or do not now contain remains of marine fauna. The author considers such lakes of so great importance in connexion with the evolution of the earth, that he thinks it the duty of physical geography to critically examine all data concerning lakes which may have a claim to be regarded as of marine origin, and